

HABITAT CONDITIONS

Dam and Hydropower Influences

Within the Jacks Fork Watershed there are currently two dams which have records within the Dam and Reservoir Safety Program Database (Figure Hc01) (MDNR 2000d). One is a reinforced earth structure located on a tributary of the South Prong of the Jacks Fork River. The height of this dam is 27 feet. The other dam is a reinforced earth structure with a height of 41 feet located on a tributary of Shawnee Creek.

Section 236.400 of the Missouri Revised Statutes defines a dam as "any artificial or manmade barrier which does or may impound water, and which impoundment has or may have a surface area of fifteen or more acres of water at the water storage elevation, or which is thirty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier or dam, if it is not across a streambed or watercourse, together with appurtenant works" (MGA 2000a).

The Dam Safety Law of 1979 established a "Dam and Reservoir Safety Council" associated with the Missouri Department of Natural Resources (MDNR 2000b and MGA 2000a). The responsibility of this council is to "carry out a state program of inspection of dams and reservoirs in accordance with regulations of the council (MDNR 2000c). The Missouri Department of Natural Resources Dam and Reservoir Safety Program operates under the guidance of the council. The program is responsible for regulating all new and existing non-federal, non-agricultural dams which have a height of 35 feet or greater in order to ensure that these structures meet minimum safety standards. In order to facilitate this, the program maintains a database on over 4,000 dams within the state to be used by private owners, professional engineers, mining companies, emergency management officials, educational institutions, other government agencies as well as private individuals (MDNR 2000c). This database includes permitted dams as well as some dams which don't require a permit.

In an effort to further determine the presence of significant dam and reservoir structures within the watershed, analysis was performed on National Wetlands Inventory (NWI) <http://www.nwi.fws.gov/overview.htm> GIS data for the watershed. Data was analyzed based on all diked/impounded waters within 100 feet of third order (Strahler) and larger stream segments. This method yielded 8 potentially significant diked/impounded sites. The largest of these sites was 2.79 acres; with the smallest being .05 acres (Table Hc01).

Channel Alterations

There have been no significant channel alterations anywhere throughout the Jacks Fork Watershed. Small channelization projects have probably occurred on private property and also from road and bridge construction. However, these activities currently are not considered to be a major threat to the river system. According to the 2001-2005 Missouri Department of Transportation Highway and Bridge Construction Schedule, <http://www.modot.state.mo.us/local/d9/d9.htm>, there are currently (2001) Two state highway construction projects scheduled within the watershed (MDT 2001). These involve bridge replacement of the Highway 17 Jacks Fork bridge and the Highway 19 Jacks Fork Bridge.

The negative impacts of gravel mining have been shown to include channel deepening, sedimentation of downstream habitats, accelerated bank erosion, the formation of a wider and shallower channel, the lowering of the floodplain water table, and channel shift (Roell 1999). In 1998 there were 4 permitted operations within the Jacks Fork Watershed (Figure Wq01) (USACOE 1998).

Natural Features

The Missouri Department of Conservation inventoried counties within the Jacks Fork Watershed between 1986 and 1991 for unique natural features (Nigh 1988; Ryan and Smith 1991). The inventories recognized seven categories of natural features: examples of undisturbed natural communities, habitat of rare or endangered species, habitat of relict species, outstanding geological formations, areas for nature studies, other unique features, and special aquatic areas having good water quality, flora, and fauna.

Since the initial natural features inventory effort the Missouri Natural Heritage Database (NHD) has been created. The database lists many of the features which were included in the Missouri Natural Features Inventory. The database, which is updated frequently, is a dynamic representation of the occurrence of many natural features in Missouri. Currently the database contains 256 features for the Jacks Fork Watershed. These include 61 examples of 12 types of natural communities: The Jacks Fork River is recognized as a significant example of an Ozark creek and small river community (MDC 1999c). Caves and dolomite glades are common throughout the watershed with many dolomite glades being rated as exceptional. Recorded occurrences of natural features currently (1999) in the NHD for the Jacks Fork Watershed include;

Caves-23

Chert Savanna-4

Creeks and Small Rivers (Ozark)-1

Deep Muck Fen-2

Dolomite Glade-16

Dry Limestone/Dolomite Cliff-2

Dry-Mesic Chert Forest-2

Fen-5

Gravel Wash-1

Moist Limestone/Dolomite Cliff-1

Oxbows & Sloughs (Ozark)-1

Pond Marsh-1

A detailed description of these terrestrial natural communities can be found in The Terrestrial Natural Communities of Missouri by Nelson (1987), while a detailed description of Missouri's aquatic communities can be found in Aquatic Community Classification System for Missouri by Pflieger (1989)

Undoubtably more examples of natural features exist within the watershed. However due to many circumstances including the limited access to private land and the large land area, many features may be as yet unrecorded. Therefore, the previous listing of features should not be regarded as final or comprehensive. However, this listing does provide a good cross section of the types of communities which can be found within the watershed.

Improvement Projects

There are 3 stream improvement projects within the Jacks Fork Watershed. These include a two cedar tree revetment projects and a rock barb project. Table Hc02 lists stream improvement projects in the watershed.

Stream Habitat Assessment

Perhaps one of the more difficult attributes of a watershed to attempt to quantify is stream habitat. This is due to the fact that there are several dynamic characteristics which make up stream habitat. To evaluate all of these characteristics individually and accurately for an entire watershed is a monumental task and beyond the scope of this document. Thus, the next best thing is to evaluate a characteristic that has the most impact on all aspects of stream habitat. This is, arguably, riparian corridor land cover/land use. Riparian corridor land cover effects many aspects of stream habitat. These include, but are not limited to water temperature, turbidity, nutrient loading, sand/gravel deposition, in-stream cover, flow, channel width, and channel stability. These in turn have effects on still other characteristics of stream habitat such as dissolved oxygen, cover, spawning areas, etc.

Evaluation of riparian corridor land cover/land use within the Jacks Fork Watershed was accomplished using Missouri Resource Assessment Partnership Phase 1 Land Cover Data (morapmd.wpd). A buffer zone 3 pixels (90 meters) wide was created which corresponded to a 1:24,000 hydrography coverage for the watershed. This was split into segments no longer than 0.25 miles long (Caldwell, personal communication). Percent land use for each segment was then calculated. Land cover/land use categories included forest, woodland, grassland, cropland, urban, and water. Percentages of these categories were then calculated for riparian corridors within each drainage units as well as for the whole watershed.

Results for the entire watershed indicate that riparian corridor land use consists of more forest/woodland (77.8%) than grassland/cropland (20.0%). Percentages for the remaining categories of urban and water are 0.9% and 1.4% respectively. Of the 12 drainage units within the watershed, the Lower South Prong Unit has the highest combined percentage of forest/woodland corridor land cover/land use at 91.2%. It also has the lowest combined percentage of grassland/cropland corridor land use at 7.3%. Table Hc03 gives riparian corridor land cover/land use percentages for all drainage units within the watershed as well as percentages for the total watershed. Figure Hc02 presents a graphic representation of riparian corridor land cover/land use for all drainage units within the watershed.

In addition to analysis of riparian corridor within drainage units, riparian corridor land cover/land use was analyzed for all fourth order (Horton) and larger streams within the watershed in order to determine those specific streams having a substantial amount of unforested riparian corridor. Analysis was based on stream miles as well as percentage of total stream miles with combined grassland, cropland, and urban land cover categories equaling greater than 25% of total riparian land cover/land use (referred to as non forested for the purposes of this document) (Table Hc04 and Figure Hc02). Results indicate that the South Prong of the Jacks Fork has the highest percentage of stream miles with non-forested riparian corridor at 68.7% (11.2 miles) Pine Branch has the lowest percentage of non-forested riparian corridor at 0.2% (0.01 miles). Approximately 29.4% (14.5 miles) of the Jacks Fork River riparian corridor is non forested.

An aerial stream survey of the Jacks Fork Watershed was made during March and April, 1996. The survey flight included portions of the Jacks Fork, South Prong, North Prong, Peters Creek, and Pine

Creek and many other major tributaries. A catalog of the flight, highlighting unstable stream and riparian areas and other significant landmarks was completed. Topographic maps were labeled according to the video index time. Information from this survey will be useful for a variety of projects such as future habitat assessment, assisting landowners with problems associated with stream bank erosion and deposition, reviewing gravel mining permits, selection of aquatic biota sampling sites, etc.

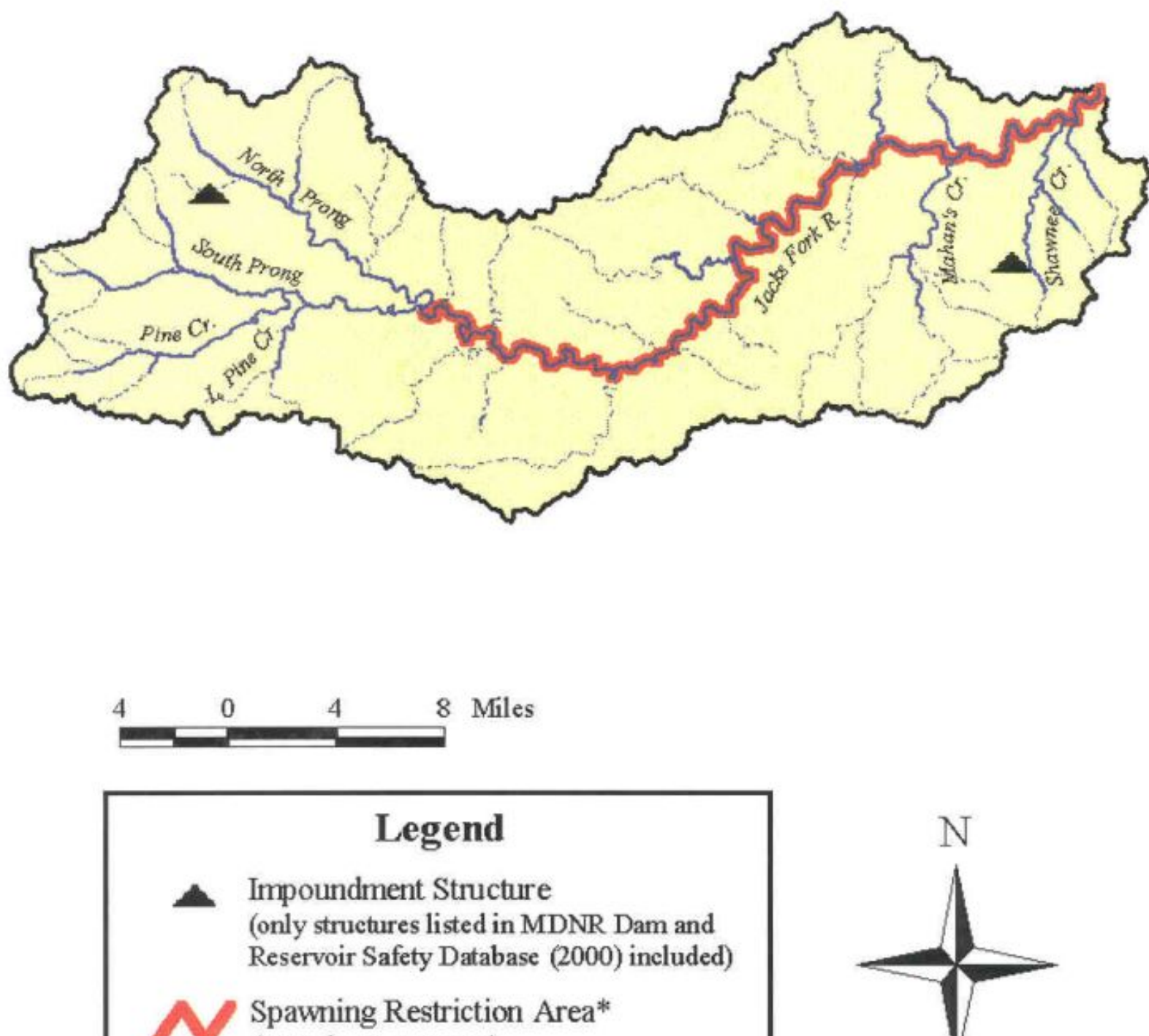
Sand and Gravel Mining Restrictions

Currently the entire Jacks Fork River is closed to sand and gravel mining from March 15 to June 15 (MDC 2000). The criteria for closing is based on the "Outstanding National Resource Waters" designation of the river and the "significant biological resources that may be impacted by sand and gravel excavation during periods of spawning, incubation, or rearing" (MDC 1997b).

Figure Hc01.

Jacks Fork Watershed

Impoundment Influence and Spawning Restrictions





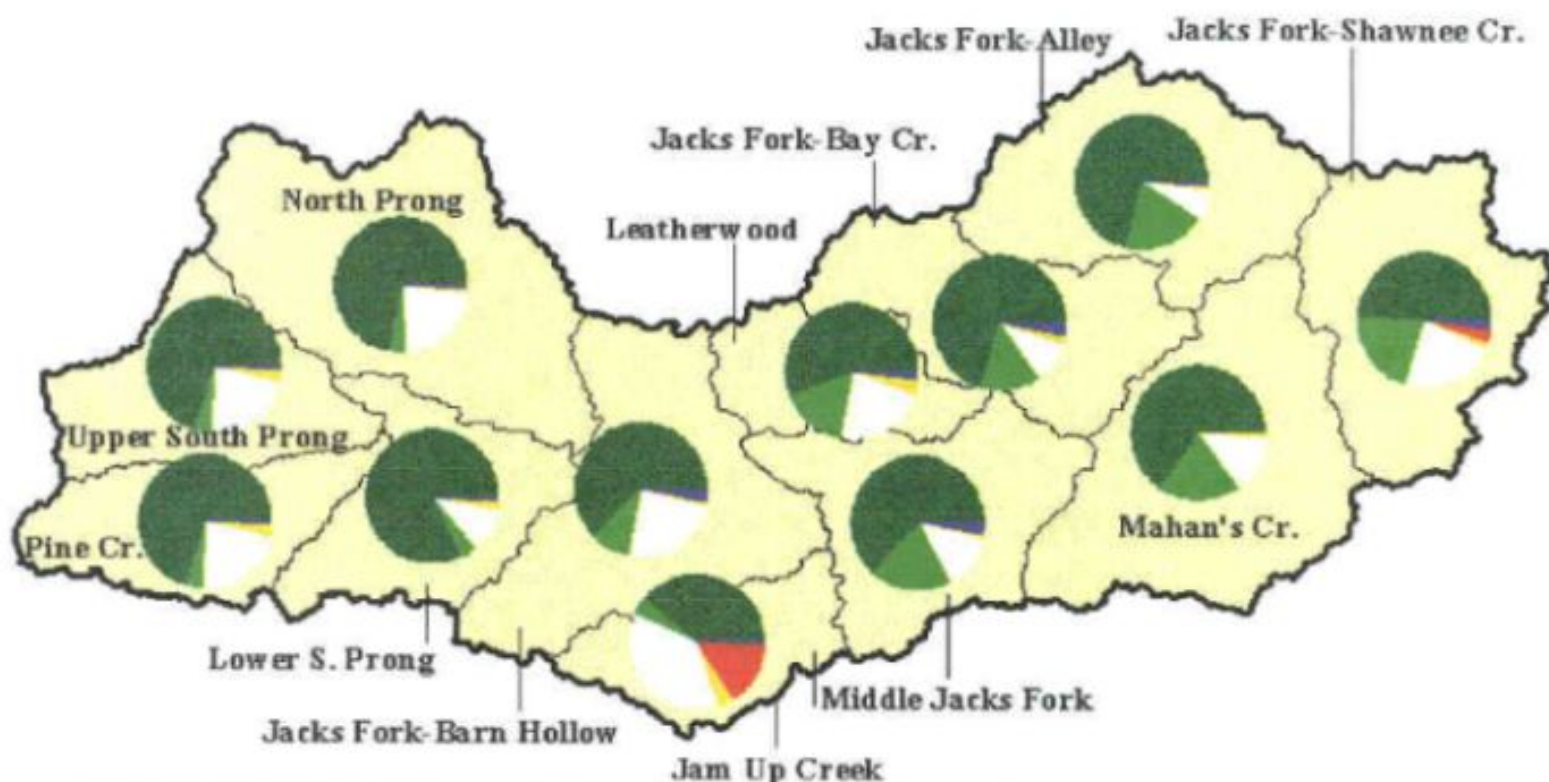
(March 15-June 15)

*This map is not a final authority. Spawning Restrictions
subject to change.

V

Figure Hc02.

Jacks Fork Watershed Riparian Corridor Land Cover

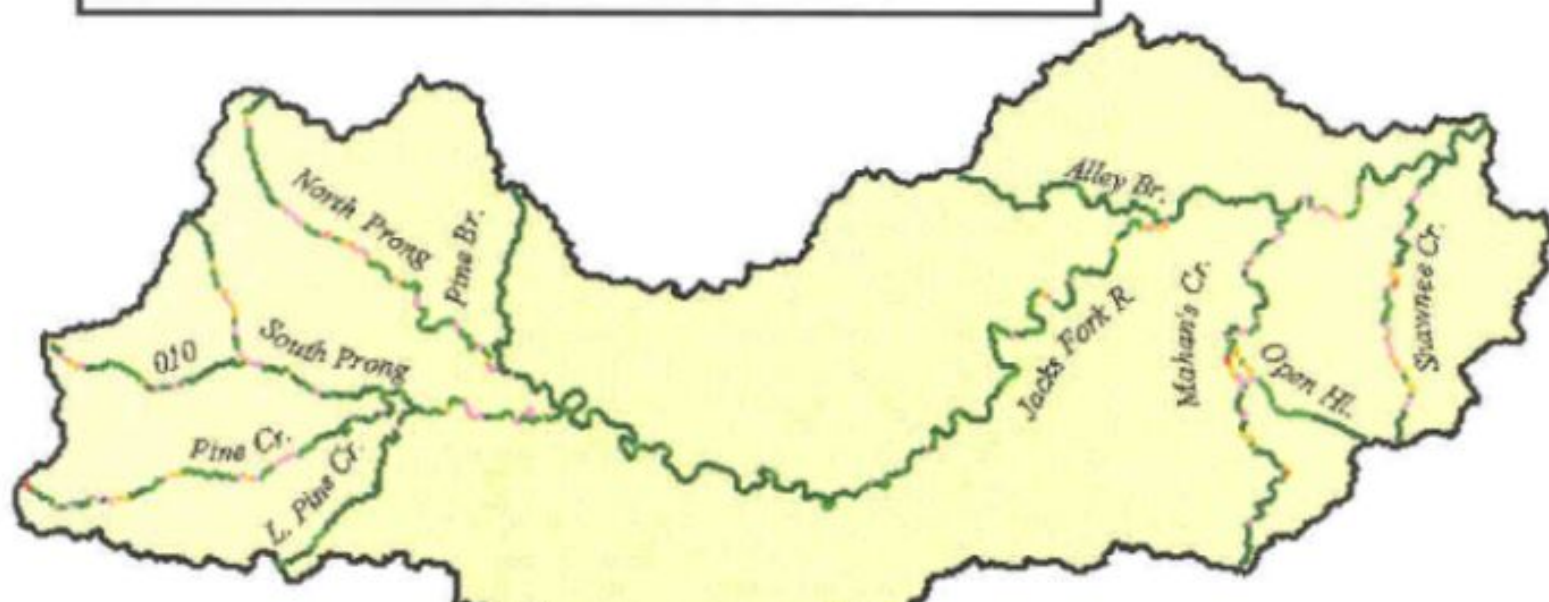


Legend

Percent Riparian Corridor Land Cover/Land Use*



*Based on Missouri Resource Assessment Partnership (MoRAP) Phase 1 Land Cover Data.





Legend

**Percent Combined Forest, Woodland, and Water
Riparian Land Cover***



*Based on Missouri Resource Assessment Partnership (MoRAP)
Phase 1 Land Cover Data.



Table Hc01. Diked/Impounded Wetland within 100 feet of third order or larger (strahler) stream segment within the Jacks Fork Watershed based on National Wetlands Inventory (NWI) Data.

Stream	Size	Instream
Pine Creek	0.13	No
Pine Creek	0.12	No
Tributary of Little Pine Creek	0.09	No
Tributary of Little Pine Creek	0.15	Yes
North Prong Jacks Fork	2.79	Yes
Tributary of the Jacks Fork	0.22	Yes
Dry Camp Hollow	0.05	Yes
Shawnee Creek	0.17	Yes

Table Hc02. Stream improvement projects within the Jacks Fork River Watershed.

Affected Stream	Project Type	Original Installation Year
S. Prong Jacks Fork	Cedar Tree Revetment	1991
Jacks Fork	Rock Barb & Willow Plantings	1992
Jacks Fork near Alley Spring Branch	Cedar Tree Revetment & Willow Plantings	1995

Table Hc03. Percent riparian corridor land cover for drainage units within the Jacks Fork Watershed. Data is based on MoRAP Phase 1 Land Cover (1997).

Unit	FOR	WDL	GRS	CRP	URB	WAT
Pine Creek	69.9	3.8	22.2	3.1	0	0.9
Lower South Prong	81.5	4.3	11.3	2.1	0	0.8
Upper South Prong	70.3	3.6	22.2	3.2	0	0.8
North Prong	72.1	4.1	21.8	1.4	0	0.5
Jacks Fork-Barn Hollow	62.3	10.2	23.5	1.4	0	2.6
Middle Jacks Fork	61.4	19.4	12.4	0.9	0	2.7
Jam Up Creek	38.8	4.5	37.0	4.3	15.3	0.2
Jacks Fork-Bay Creek	70.5	15.4	9.9	1.7	0	2.6
Leatherwood	55.9	16.3	21.8	3.9	0	2.2
Mahan's Creek	65.1	19.9	13.8	0.9	0	0.3
Jacks Fork-Alley Branch	71.4	19.8	6.5	0.8	0	1.4
Jacks Fork-Shawnee Creek	49.5	20.6	23.1	2.2	3.0	1.7
Watershed	65.5	12.3	18.1	1.9	0.9	1.4

FOR =Forest, **WDL**=Woodland, **GRS**=Grassland, **CRP**=Cropland, **URB**=Urban, **WAT**=Water

Table Hc04. Stream miles as well as percentage of total stream miles (in parenthesis) for fourth order (Horton) and larger streams with combined grassland, cropland, and urban (non-forested for the purposes of this document) land cover categories equaling 25% or greater of total riparian land cover/land use. Results given by order (Strahler) as well as total stream length. Data is based on 1:24,000 hydrography layer combined with Missouri Resource Assessment Partnership (MoRAP) Phase 1 Land Use/Land Cover Data (1997).

Stream	Order						Total
	1st	2nd	3rd	4th	5th	6th	
Alley Br.	0	0	0.47 (31.1)	0.70 (26.1)			1.17 (16.8)
Jacks Fork	-----					14.5 (29.4)	14.5 (29.4)
JFW010	0.23 (38.3)	1.12 (73.7)	1.32 (100)	1.52 (46.9)			4.19 (62.7)
L. Pine Cr.	0.49 (41.9)	-	0.47 (23.2)	0.05 (1.4)			1.01 (14.8)
Mahan's Cr.	0	0	0.56 (57.7)	3.33 (66.2)	4.02 (71.0)		7.91 (60.4)
N. Prong	0.17 (19.8)	1.31 (78.0)	2.38 (78.3)	6.88 (89.6)	0.46 (11.5)		11.2 (64.9)
Open Hl.	0	0	2.77 (96.2)	0.7 (86.4)			3.47 (66.6)
Pine Cr.	0	0	1.84 (74.5)	6.48 (68.0)			8.32 (64.2)
Pine Br.	0.01 (1.4)	0	0	0			0.01 (0.2)
Shawnee Cr.	0	0.26 (35.1)	4.41 (80.5)	1.36 (43.0)			6.03 (61.2)

S. Prong	0	0.32 (32.7)	1.73 (95.6)	0.95 (95.0)	8.16 (70.6)		11.16 (68.7)
-----------------	---	----------------	----------------	----------------	----------------	--	-----------------